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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/872,458	05/31/2001	Clifford N. Click	SUNMP018	3013

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MARTINE & PENILLA, LLP  
710 LAKEWAY DRIVE  
SUITE 170  
SUNNYVALE, CA 94085

EXAMINER
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KENDALL, CHUCK O

ART UNIT	PAPER NUMBER
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2122

DATE MAILED: 10/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/872,458

Applicant(s)

CLICK ET AL.

Examiner

Chuck Kendall

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

***DETAILED ACTION***

1. This action is in response to the application filed 06/01/2004.
2. Claims 1 – 26 have been examined.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 – 6 & 21 - 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert et al. USPN 5,121,498 in view of Gosling USPN 5,668,999.

Regarding claim 1, Gilbert discloses a method for loop optimization within a dynamic compiler system, comprising: creating a pre-loop structure based on an original loop structure (3:20 - 24), for indexing expressions, see routine calls); generating a main loop structure having indexing expressions based on the original loop structure, wherein the indexing expressions cannot produce an underflow (17:33 - 43, for main loop and original loop see nested loops) and creating a post-loop structure based on the original loop structure. Gilbert doesn't explicitly disclose wherein the pre-loop structure is capable of testing indexing expressions for underflow and wherein the post-loop structure is capable of testing indexing expressions for overflow. However Gosling does disclose this feature in an analogous art (FIGURE 4C, 452, FIGURE 4D, 472, also related text 5: 5 – 10, and 8: 40 – 50). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Gilbert and Gosling because, using different iterations of the loop to perform different functions makes the program more efficient.

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Regarding claim 2, a method as recited in claim 1, wherein the pre-loop structure includes an array boundary test (Gilbert, 4: 18 – 32).

Regarding claim 3, a method as recited in claim 2, wherein the post - loop structure includes an array boundary test (Gilbert, 4:1 - 5, calls for multiple loop levels and nested loops from previously cited section above).

Regarding claim 4, a method as recited in claim 3, wherein the main loop structure does not include an array boundary test (Gilbert, 5:1 - 5).

Regarding claim 5, a method as recited in claim 1, further including the operation of compiling a computer program during execution of the computer program (Gilbert, FIGURE, 18).

Regarding claim 6, a method as recited in claim 5, further including the operation of interpreting lines of the computer program during execution of the computer program (Gilbert, 8: 15 - 17, for interpreting see AM).

Regarding claim 21, which cites similar limitations as previously discussed see rationale in claim 1.

Regarding claim 22, which cites similar limitations as previously discussed see rationale in claim 2.

Regarding claim 23, which cites similar limitations as previously discussed see rationale in claim 3.

Regarding claim 24, which cites similar limitations as previously discussed see rationale in claim 4.

Regarding claim 25, which cites similar limitations as previously discussed see rationale in claim 5.

Regarding claim 26, which cites similar limitations as previously discussed see rationale in claim 6.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 7, 9 – 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gilbert et al. USPN 5,121,498 in view of Gosling USPN 5,668,999 as applied in claim 1, and further in view of Kawahito et al. USPN 6,519,765 B1.

Regarding other limitations in claim 7, Gilbert and Gosling teaches all the claimed limitations as applied in claim 1 above. The combination of Gilbert and Gosling doesn't explicitly disclose, creating a range check elimination loop structure based on the original loop structure during the compiling operation, wherein the range check elimination loop structure includes a pre-loop structure, a main loop structure, and a post-loop structure the pre-loop structure being capable of testing indexing expressions for underflow. However, Kawahito does disclose in an analogous art, optimizing by eliminating redundant array range checks by performing versioning for a loop (3: 50 – 56). Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the modification of Gilbert and Gosling with Kawahito because, performing test and range checks for a loops eliminates redundant array ranges and optimizes the program.

Regarding claim 9, a method as recited in claim 8, wherein the main loop structure, wherein indexing expressions included in the main loop structure cannot produce an underflow, and wherein the indexing expressions cannot produce an overflow (Gosling, FIGURE 4D, 472).

Regarding claim 10, which cites similar limitations as previously discussed see rationale in claim 9.

Regarding claim 11, which cites similar limitations as previously discussed see rationale in claim 2.

Regarding claim 12, which cites similar limitations as previously discussed see rationale in claim 3.

Regarding claim 13, which cites similar limitations as previously discussed see rationale in claim 4.

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Regarding claim 14, which cites similar limitations as previously discussed see rationale in claim 6.

Regarding claim 15, which cites similar limitations as previously discussed see rationale in claim 7.

Regarding claim 16, which cites similar limitations as previously discussed see rationale in claim 2.

Regarding claim 17, which cites similar limitations as previously discussed see rationale in claim 3.

Regarding claim 18, which cites similar limitations as previously discussed see rationale in claim 4.

Regarding claim 19, which cites similar limitations as previously discussed see rationale in claim 6.

Regarding claim 20, which cites similar limitations as previously discussed see rationale in claim 7.

***Response to Arguments***

7. Applicant's arguments, see page 8 of Applicant's response, filed 06/01/2004, with respect to the rejection(s) of claim(s) 1 – 7, & 9 – 26 under 35 USC § 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kawahito et al. USPN 6,519,765 B1.

Regarding Applicant's argument in claim 1, that Gosling doesn't disclose "testing indexing expressions for underflow", Examiner believes that prior art does infact disclose that feature. As set forth above in claim 1 and as disclosed in Gosling in, 5: 5 – 10, and 8: 40 – 50, Gosling shows determining underflows within an indexed structure (stack or array).

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*Conclusion*

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuck Kendall whose telephone number is 703-3086608. The examiner can normally be reached on 10:00 am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on 703-3054552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CK

*Chameli C. Das*  
**CHAMELI C. DAS**  
**PRIMARY EXAMINER**  
*10/18/09*